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Contribution of Foreign Direct Investment to Economic Growth in Bangladesh

Mohammed Abu Rayhan

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CONTRIBUTION OF FOREIGN DIRECT INVESTMENT TO

ECONOMIC GROWTH IN BANGLADESH

(TITLE)

BY

MOHAMMED A. RAYHAN

THESIS

SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS
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Contribution of Foreign Direct Investment to Economic Growth in Bangladesh

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2014

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Contribution of Foreign Direct Investment to Economic Growth in Bangladesh

ABSTRACT

Rapid industrialization is essential in Bangladesh to keep pace with its development needs. But the low rate of gross domestic savings and investment as well as low level of technology base hamper the expected industrialization process. Foreign aid and grant had been serving to bridge the gap earlier. As many developing countries are in the process of graduating from being aid-dependent economy into a trading economy, FDI has come to be viewed as a major stimulus to economic growth for these emerging economies. This paper examines the contribution of FDI to economic growth in Bangladesh over the period from 1975 to 2012. Data are compiled from World Development Indicators (WDI), International Financial Statistics (IFS), and Penn World Table (version 8.0). This paper takes the conventional neoclassical production function-type synthesis that considers FDI (foreign capital) as a factor input that depends on a set of relevant factors available in the host economy. Statistical models – OLS, 2SLS, VAR – are used for empirical analysis in this paper. The study reveals that if FDI increases 1%pt, per capita growth could rise by 1.65 to 6.05 %pts in the IV model. This is a manifestation from available dataset, although not a statement as our further tweak has failed to uncover lower values. These large numbers can be understood only in the context of a major push to growth given by FDI in the textile and garment industries. The study also finds bi-directional relationship in the Granger causality sense between FDI and GDP per capita.

Keywords: Foreign Direct Investor (FDI), GDP per capita growth, Bangladesh, Time Series, OLS, 2SLS, VAR, Causality

Dedicated to——

In loving memories of my grandparents

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CHAPTER ONE

Introduction

In the standard neoclassical model of economic growth, increases in capital stock and labor force contribute to higher output. Many policymakers and academics contend that foreign direct investment (hereafter, FDI) can have important positive effects on a host country's development effort. In addition to the direct capital financing it supplies, FDI can be a source of valuable technology and knowhow while fostering linkages with local firms, which can give an economy a further growth push. Based upon these arguments, both industrialized and developing countries offer lucrative incentives to encourage inflows of foreign direct investments in their economies.

The term FDI refers to investment that is made to acquire a lasting interest in an enterprise operating abroad. In other words, FDI is an international financial flow with the intention of controlling or participating in the management of an enterprise in a foreign country. There is conceptual ambiguity in the understanding of FDI. The World Investment Directory from UNCTAD clarifies the concept well¹ whereas formal definitions of FDI are provided in (1) the Balance of Payments Manual (International Monetary Fund, 1997 and 1993) and (2) the Detailed Benchmark definitions of FDI (Organization for Economic Co-operation and Development, 1992 and 1996).

According to the Balance of Payments Manual (IMF, 1997), FDI refers to investment made to acquire lasting interest in enterprises operating outside of the economy of the investor. Further, in cases of FDI, the investor's purpose is to gain an effective voice in

¹ UNCTAD Investment Brief: 2000: 51-54

the management of the enterprise. The foreign entity or group of associated entities that makes the investment is termed the “Direct Investor”. The unincorporated or incorporated enterprise- a branch or subsidiary, respectively, in which direct investment is made- is referred to as a ‘direct investment enterprise’. Some degree of equity ownership is almost always considered to be associated with an effective voice in the management of an enterprise. According to the revised edition of the manual, IMF suggests a threshold of 10% of equity ownership to qualify an investor as a foreign direct investor.

FDI inflows have in general been recognized as beneficial to economic growth in developing countries in terms of national productivity improvement (Zhao and Zhang, 2010), reduction in the level of unemployment (Chaudhury et al., 2006), expansion of domestic investment, transfer of advanced technologies from abroad, greater competition in the host country, and rising export values and foreign exchange earnings (Ram and Zhang, 2002). The majority of studies (e.g. Balasubramanyam, 1996; Keller, 1996; and OECD, 2002) conclude that FDI contributes to total factor productivity and income growth in host economies, over and above what domestic investment would trigger. The studies further find that policies that promote indigenous technological capability, such as education, technical training, and research and development increase the aggregate rate of technology transfer from FDI and that export promoting trade regimes are also an important prerequisite for a positive FDI impact. Many developing countries have, therefore, actively tried to attract FDI, especially since the 1980s.

Meanwhile, FDI is sometimes claimed to have a negative effect on the economic development of a country if it leads to a substantial outflow in the form of repatriation of profits and dividends, or if the multinational companies obtain excessive tax or other

concessions from the host country. These negative effects may be even larger if the technology transferred is not appropriate for the economic development of the host country, the amount of royalty payments is excessive, or foreign invested enterprises drive away too many indigenous enterprises through severe competition. Many multinational corporations (MNCs) target the domestic market of the host country for most of the sale of the output produced there rather than making serious efforts to export the output. FDI may cause distortions in economic policy through extra benefits that governments usually provide to foreign investors, and may infuse social and cultural norms not appropriate to the host country (Ram and Zhang, 2002 and Ramirez, 2006).

Bangladesh, a densely populated, agro-based, developing South Asian economy has a per capita income of US\$ 1048 and has achieved a GDP growth rate around 6% in recent years. Like many developing countries, it wants to boost its economic performance for a better future. Bangladesh is distinguished among the Least Developed Countries (LDCs) because of its relative success in economic and rural development². Rapid industrialization is indeed necessary for this country to keep pace with its developmental needs. But the low rates of gross domestic savings and investment as well as a low level of technology hamper the expected industrialization process. There is a significant saving-investment gap³ in Bangladesh. Foreign aid and grants have served to bridge the gap in the past. But as foreign aid has decreased in recent years and developing countries are in the process of graduating from being aid-dependent economies into more of trading economies, FDI is viewed as a major potential stimulus to economic growth and

² MDGs: Bangladesh Progress Report 2012, Bangladesh Planning Commission

³ The savings-investment gap has been persistent from the early-1990s- except in the year 2000-01 when there was excess investment over savings. This excess liquidity- excess of savings over investment- in the recent years has been almost 2 percent of GDP.

industrialization. As a result, there is now widespread support for the need for FDI in Bangladesh. If its economy is to grow faster, as is being envisaged, it seems to need sustained inflows of FDI at a higher level with a view to creating jobs for its vast surplus labor, increasing foreign exchange earnings, and acquiring modern technology and management skills.

This thesis examines the contribution of FDI towards economic growth in Bangladesh over a period of 38 years from 1975 to 2012 in a multivariate regression framework. Data are compiled from World Development Indicators (WDI), International Financial Statistics (IFS), and Penn World Table (version 8.0). We first postulate a neoclassical growth model based on the aggregate production function. We then specify the underlying statistical models to be estimated while providing the theoretical underpinnings for the inclusion of explanatory variables. In this regard, the remainder of this thesis is organized as follows: Chapter 2 presents FDI trends and FDI relevant policies in Bangladesh. Chapter 3 highlights previous findings about the relationship between research on FDI and economic growth. Chapter 4 provides theoretical framework, data collection and the methodology of the study. Chapter 5 analyzes and interprets the empirical findings, and Chapter 6 concludes the paper with some policy implications of research.

CHAPTER TWO

FDI Trends and FDI Relevant Policies in Bangladesh

To put FDI trends in Bangladesh in the global context, UNCTAD reports that FDI around the world has remained low in recent years relative to a peak of \$2 trillion in 2007. Global FDI fell by 18 percent to \$1.35 trillion in 2012 and was expected to rise somewhat in 2013 to \$1.45 trillion as the upper level of the predicted range (Figure 1). Transnational corporations (TNCs) held on to their record level of cash holdings during the global financial crisis of recent years. As macroeconomic conditions improve and investors regain confidence over the medium term, TNCs may convert some of their cash hoarding into investment. UNCTAD predicts that FDI inflows may then reach \$1.6 trillion in 2014 and \$1.8 trillion in 2015.

The regional distribution of FDI is shown in Figure 2. Analyzing trends of FDI among the developing countries, Nunnenkamp (2001) concludes, South, East, Southeast Asia have emerged as the most important host region among the developing economies. Ranked second were the Central and Eastern Europe regions. Latin America, though slow compared to Asia, is the third most important host region. Africa and West Asia have been on the sideline in attracting FDI. However, the irony is Africa's share of the global FDI remains small and the lowest, despite known for yielding the highest rate of return. Figures 1 and 2 portray that developing Asia attracts more FDI than other regions. FDI inflows to South Asia declined significantly in 2012 followed by a sharp rise of 10 percent, to \$36 billion in 2013 (Figure 3) because of decreases across a number of major recipient countries including India, Pakistan and Sri Lanka. Inflows to the three countries

dropped by 29, 36 and 21 percent to \$26 billion, \$847 million and \$776 million respectively. FDI to Bangladesh also decreased by 13 percent, to about \$1 billion. Nonetheless, this country remained the third largest recipient of FDI in the region, after India and the Republic of Iran (Figure 12). Bangladesh, India, Pakistan and Sri Lanka have become important players in global apparel exports and the first two of these countries rank fourth and fifth globally, after China, the EU and Turkey (WTO, 2010).

The readymade garment (RMG) industry emerged in Bangladesh in the late 1970s and has become a key manufacturing industry now. Its nearly 5000 factories employ some 3 million workers and account for about three fourths of the country's total exports. In particular, Bangladesh stands out as the sourcing hotspot in the industry because it offers the advantages of both low costs and large capacity. However, working conditions and other labor issues are still a major concern, and a number of disastrous accidents that happened recently underscore the daunting challenges facing the booming garment industry in the country.⁴ FDI played a central role in the early stage of the industrial development process, but now local firms dominate the industry (Fernandez-Stark et. al 2011). By providing various contract manufacturing services, Bangladesh has been able to export to markets in the EU and the US. Before 2000, most of the firms were involved in cut, make and trim (CMT) operations. More recently, however, many have been able to upgrade to original equipment manufacturing, thus being able to capture more value locally. The RMG industry provides good opportunities for export-driven industrialization. Using their local advantages in terms of large supply of labor at low cost as well as government policy supports (e.g. FDI policies encouraging linkages),

⁴ More than 700 workers have died in fires in garments factories since 2005, according to labor groups. The collapse of the Rana Plaza Complex on 24 April 2013 led to the death of more than 1000 garment workers.

South Asian countries, such as Bangladesh and Sri Lanka, have been able to link to the global value chain and build their domestic productive capacities. Moreover, corridors linking South Asia and East and South-East Asia are being established. The two such corridors in the region are the Bangladesh-China-India-Myanmar economic corridor and the China-Pakistan economic corridor. This is likely to help enhance connectivity between Asian sub-regions and provide opportunities for regional economic cooperation. The initiatives are likely to accelerate infrastructure investment and improve the overall business climate in South Asia.

At the time of independence in 1971, Bangladesh inherited only a small stock of FDI, most of it by TNCs, and geared toward exploiting a domestic market protected by the then prevailing import-substitution policy. Since then, Bangladesh has been trying to attract foreign investment to underwrite its savings-investment gap as well as to redress its export-import imbalance. The country has deregulated and liberalized its foreign investment regime over the last two decades. This has been done largely under a World Bank and IMF backed Structural Adjustment Policy (SAP) package. Moreover, with a view to encouraging the flow of FDI, Export Processing Zones (EPZs) were established. The capital markets were allowed to receive foreign portfolio investments in both primary and secondary markets. The government of Bangladesh has listed the following five areas in which FDI should be encouraged under joint venture or up to 100% ownership by the foreigners (Bhattacharya, D. 2005):

- i) Export oriented industries
- ii) Industries located in the export processing zones (EPZs)
- iii) Industries that are based on high technology, which will either be import

substitute or export oriented

- iv) Basic industries dependent mainly on local raw materials and investment towards improvement of quality and marketing of goods manufactured and/or the increase of production capacities of existing industries
- v) Physical infrastructure projects of both types: Build-Operate-Own (BOO) and Build-Operate-Transfer (BOT).

The Foreign Private Investment Act has also been enacted in Bangladesh to provide legal protection to foreign investment in Bangladesh against nationalization and expropriation. It also guarantees repatriation of profit, capital and dividend, and equitable treatment with local investors. Intellectual property rights, such as patents, designs and trademarks and copyrights, are protected. Bilateral Investment Guarantee agreements have been signed with a number of countries to avoid double taxation. Bangladesh is a signatory to the International Convention for Settlement of Investment Dispute (ICSID), The Multilateral Investment Guarantee Agency (MIGA), and a member of World Intellectual Property Organization (WIPO) and the world Association of Investment Promotion Agencies (WAIPA). These memberships have been taken largely under a World Bank and IMF-backed Structural Adjustment Policy (SAP) over the last two decades. Hence, property and other rights of foreign investors are safeguarded according to international standards. Trade has been liberalized and import duties reduced. Customs and bonded warehouses assist exporters. Free repatriation of profits is allowed, and the Taka, the local currency, is almost fully convertible on the current account. No prior approval is required for FDI except registration with the Board of Investment (BOI) or Bangladesh Export Processing Zone Authority (BEPZA). Bangladesh is a member of a number of regional and sub-

regional cooperation agreements. These include the South Asian Association for Regional Cooperation (SAARC) in 1985; the South Asia Preferential Trading Agreement (SAPTA) in 1993; Bangladesh, India, Myanmar, Sri Lanka, and Thailand Economic Cooperation (BIMSTEC) in 1997; and South Asia Free Trade Agreement (SAFTA) in 2004. A number of bilateral trade agreements with neighboring countries, including India, are also being explored. Bangladesh also signed a Trade and Investment Cooperation Forum Agreement (TICFA) with the USA in 2013. Notwithstanding the dominance of such a liberal policy regime and trading agreements, however, Bangladesh has not been able to attract a desirable level of FDI.

Despite having made substantial progress over the past twenty years, FDI inflows remain generally low and recent growth has been sluggish (Figure 4 and 5). Statistics for the late 1990s and early 2000s show that FDI increased annually at staggering rates of 64.5, 47.2 and 182.9 percent during the fiscal years 1997-98, 2000-01 and 2004-05 respectively. The FDI inflows were US dollars 603.3 million, 563.9 million and 803.8 million in FY 1997-98, FY 2001-02 and FY 2004-05 respectively. After 2004-05, FDI declined in the next three fiscal years, increased to \$960 .6 million in 2008-09 and fell again in the following years. If the current trend persists, the country might receive \$889.0 million of FDI in 2014-15 reflecting an increase of only 3.2 percent. FDI in Bangladesh in the form of equity capital has been showing an erratic movement making it difficult to estimate its future trend. While reinvestment is showing some steady growth, the intra-company loan inflow reveals a downward trend during 1996/97-2014/15 (Figure 6).

For export-oriented activities, the government has set eight export processing zones (EPZs). Despite expansion of facilitation services and the provision of a variety of fiscal and non-fiscal incentives, FDI in EPZs has not increased relative to non-EPZs (Figure 7). According to Bangladesh Bank, the central bank of the country, EPZs have attracted nearly \$1 billion in FDI flows in 2000-2010, accounting for roughly 14 percent of total inflows in that period. Nearly 80 percent of investments in EPZs are in textile and garments. Outside of textile-related industries, manufacturing of electronics, metal products and plastic goods are emerging as main activities in EPZs with at least 10 operating enterprises each. Most FDI in EPZs come from Asian economies⁵. There have been several shifts globally in the concentration and composition of FDI among sectors. Consequently, Bangladesh has also witnessed a huge shift in sector-wise and country-wise flows of FDI in the current decade (Figure 8).

With respect to sectoral performance, telecommunications, banking, textiles, and gas and petroleum have been the major recipients of FDI in 2005-2011. Bangladesh has done relatively well in attracting FDI into telecommunications which has received \$2.2 billion during the period (UNCTAD, Investment Policy Review: Bangladesh, 2013). There are three fully foreign-owned mobile telephony providers in the country as well as majority foreign stake in the company with the largest market share. In banking, the country has attracted some globally renowned banks. As a result, during 2005-2011, FDI in the banking industry amounted to \$1 billion as compared to \$946 million in the textile and garments. All these investments, however, amount to a relatively small portion of

⁵ With the 72 enterprises and \$489 million worth of investment, the Republic of Korea is the largest source of FDI in EPZs, followed by China (\$305 million), Japan (\$201 million), Taiwan province of China (\$163 million) and Malaysia (\$113 million)

total investment in a country that generated over \$22.2 billion in foreign exchange earnings through exports in 2011.

A sector that faces FDI restrictions is pharmaceuticals despite being a vibrant industry for domestic investment within the country. On the contrary, nearly \$885 million of FDI has gone to the gas and petroleum sector, most of which for natural gas exploration and extraction. Four foreign companies are currently in control of 52 percent of the country's natural gas production capacity (Petro Bangla, 2011).

FDI inflows into Bangladesh have been well diversified by country of origin. Egypt has been the top source country investing about \$830 million or 9 percent of cumulative inflows in 2005-2011, followed by the United Kingdom, the United States of America, and Singapore. FDI from Egypt is concentrated in telecommunications while FDI from the United Kingdom is diversified across many sectors with the presence of such TNCs as Unilever, Standard Chartered and British-American Tobacco. FDI from the USA is similarly diversified, but characterized by large investment in gas and petroleum.

CHAPTER THREE

Literature Review

Literature on foreign direct investment can be divided broadly into two parts. One deals with the main factors that allow countries to attract FDI whereas the second and larger part discusses whether and how much FDI contributes to economic growth. FDI seems to be highly important as a catalyst to overall investment and growth in many developing countries. Several different factors have affected the volume and distribution of FDI in developing countries of the world. The main beneficiaries of the major FDI inflows have been the countries with political stability (Ghurra and Goodwin, 2000; Root and Ahmed, 1979; De Mello, 1999; Cheng and Kwan, 2000; Schneider and Frey, 1985; Wang and Swain, 1995), favorable policies regarding taxes and subsidies (De Mello, 1999), existence of good business environment, better administrative policies and low level of corruption (Loot, 2000; Ghurra and Goodwin, 2000). Moreover, macro variables such as the size of domestic market, physical infrastructure, skilled labor force, trade openness, inflation, labor cost, productivity and interest rate have also been identified as other important factors affecting FDI in developing countries (Kravis and Lipsey, 1982; Wheeler and Moody, 1992; De Mello, 1997; Lucas, 1993; Wang and Swain, 1995).

There have been many empirical studies examining the effect of FDI on economic growth of developing countries. Literature shows that such an effect of FDI inflows on economic growth differs depending on the countries examined (Ramirez, 2000, 2006; Zhang, 2001; Alguacil et al., 2002; Chakraborty and Basu, 2002; Kohpaiboon, 2003). FDI can contribute to growth through several channels. It can directly affect growth

through capital formation. As a part of private investment, an increase in FDI will, by itself, contribute to an increase in total investment and hence growth.

Alfaro (2003) shows that the growth benefits of FDI vary greatly across primary, secondary (manufacturing), and tertiary sectors. An empirical analysis using cross-country data with 47 countries for the period 1980-1999 suggests that total FDI exerts an ambiguous effect on growth.

Khawar (2007) examines the impact of contemporaneous foreign direct investment on growth in the period 1970-92 using ordinary least squares (OLS). The study found that foreign direct investment is significantly and positively correlated with growth as well as domestic investment. The population growth rate, initial GDP and political instability variables were negatively correlated with growth, consistent with the findings in much of the empirical growth literature. The human capital measure was not significant in the analysis.

Flexner (2000) examines the effect of FDI on per capita GDP growth over the period 1990-1998 and finds that FDI has a statistically significant impact. Hansen and Rand (2006) analyze the causal relationship between FDI and GDP in a sample of 31 developing countries. Using estimators for heterogeneous panel data, they find a unidirectional causality from FDI to GDP implying that FDI causes growth.

Borensztein et al. (1998) find that FDI is more productive than domestic investment only when the host country has a minimum threshold stock of human capital. De Mello (1999) finds a positive impact for FDI on output growth regardless of the technological status of a host country, i.e., whether or not the country is a technological leader.

Dritsaki et al. (2004) investigate the relationship between trade, FDI and economic growth for Greece over the period 1960-2002. Using cointegration analysis, their study suggests that there is a long run equilibrium relationship between FDI and growth. They also use the Granger causality test and the results show that there is a causal relationship between the variables. A similar type of study is examined by Feridun (2004) for Cyprus, 1976-2002. Feridun finds strong evidence that economic growth in Cyprus is Granger caused by FDI, but not vice versa.

Chowdhury and Mavrotas (2003) examine the causal relationship between FDI and economic growth for Chile, Malaysia and Thailand using time series data covering the period 1969-2000 and their empirical findings clearly suggest that GDP causes FDI in the case of Chile and not vice-versa, while for both Malaysia and Thailand, there is a strong evidence of a bi-directional causality between the two variables.

Lensink and Marrissey (2001) estimate the standard model using cross section, panel data and instrumental variable techniques and find that FDI has a positive effect on growth whereas volatility of FDI has a negative impact. They also find that the evidence for a positive effect of FDI does not depend on which other explanatory variables are included, although the significance of the estimated coefficient does vary according to the specification used.

Kumer (2002) argues that FDI has emerged as the most important source of external resource flows to developing countries over the 1990s and has become a significant part of capital formation in these countries despite the fact that their share in global distribution of FDI continues to remain small or in some cases it even shows a decline.

Mian and Alam (2006) find that FDI remains a determinant of economic growth in Bangladesh. But government ineffectiveness in controlling corruption, improving political stability and establishing rule of law, and failure to increase physical and institutional policy infrastructure are the main reasons for a restrained FDI flows to Bangladesh.

Bhattacharaya (2004) has estimated that a ten percent increase in FDI results in a 3.7 percent increase in the GDP of Bangladesh. Further calculations then show that a one percent reduction in poverty would require an annual growth in FDI of thirteen percent. Hence, augmentation of FDI inflow and ensuring its greater effectiveness in poverty reduction remain a key task of the Bangladesh government as poverty reduction has been an important economic goal in the country.

Ahmed (1975) also finds that FDI plays an important role in the process of industrialization and economic growth in developing countries. Most of the countries in the world have recognized that FDI by TNCs contribute in many ways to the process of growth. Since 1980s, this has led to a dramatic shift in the attitude of developing countries towards FDI.

Zhang (2001) argues that FDI tends to promote economic growth when the host countries adopt a liberal trade regime. Furthermore, improvement in education and human capital is a requirement for FDI-led growth. The host country needs to encourage export-oriented FDI and maintain macroeconomic stability.

Zhang (2000), on the other hand, claims that economic growth leads to FDI growth. Rapid economic growth in the host country increases aggregate demand which stimulates

higher demand for investments including FDI. Hermes and Lensink (2003) examine the role of financial systems in 67 countries and conclude that the development of financial system is an important factor for FDI to have a positive impact on growth. According to these authors, 37 of the 67 countries had “a sufficiently developed financial system in order to let FDI contribute positively to economic growth”.

Wang (2009) studies the heterogeneous effects of sectoral FDI on host country's economic growth. Using data from 12 Asian economies over the period 1987-1997, Wang shows that FDI in manufacturing sector has a significant and positive effect on economic growth, whereas FDI in non-manufacturing sectors does not play a significant role in growth.

By examining the experiences of 12 Latin American countries over the period 1950-1985, De Gregorio (1992) found that FDI boosted economic growth three times as much when compared with aggregate investment. Blomstrom et al. (1992) arrived at a similar conclusion using a larger sample of developing countries. They found not only that FDI has a strong impact on growth, but that this effect is limited to higher-income developing countries. For lower-income nations, other factors, such as secondary education, were more important. Ram and Zhang (2002) use data for the 1990s from a large cross-section of countries, and found a positive impact of FDI on growth.

The belief that FDI provides extra benefits to the economy is, however, not universally shared. Nunnenkamp and Spatz (2003) use data on United States FDI stock abroad and find that the link between FDI and economic growth is quite weak. On a slightly brighter note, they discover a stronger relationship between the two in countries with more favorable socioeconomic characteristics, such as better institutions, more

educated workforce and openness to trade. In general, however, they are quite skeptical about the benefits of FDI. They argue that it is easier to attract FDI than to derive benefits from it.

Carkovic and Levine (2002), who used macro-level data, found little support for the importance of FDI in stimulating growth. They argue that previous studies that show the benefits of FDI on economic growth have not fully taken into account the endogeneity problem. Countries with a good economic performance tend to attract more FDI making FDI endogenous in a growth model. Therefore, if the endogeneity problem is not taken into account, it is unclear whether FDI drives economic growth, or vice versa. Once the endogeneity problem is accounted for, they conclude, growth drives FDI and not vice versa. This result has been supported by other studies as well. Li and Liu (2005), using a large sample of developed and developing countries, find that since the mid-1980s the relationship between FDI and economic growth has become increasingly endogenous. Both Zhang (2002) and Zhang (1999) find evidence of a two-way Granger causality in the relationship between FDI and China's economic growth. Similarly, Choe (2003) in a large sample of 80 countries finds evidence of a two-way causality between FDI and economic growth. In addition, he also states that the effects are more apparent from economic growth to FDI.

Balasubramanyam et al. (1996) emphasize the importance of providing the right economic environment to ensure that FDI is beneficial to the economy. They find that countries with a neutral trade regime, where artificial incentives favor neither export-oriented nor domestic market-oriented industries, fare better than countries where a specific industry is favored. This is because in a neutral regime, firms' decisions are

governed by market forces rather than by artificial incentives. Furthermore, a liberal regime also allows for competition between domestic and foreign firms and these in turn provide innovation and learning that contribute to economic growth. This is further supported by Busse and Groizard (2006) who find that FDI does not affect economic growth in a very highly regulated country. However, it seems that there can be a wide range of regulatory regimes under which FDI can still prove beneficial. This is encouraging as it suggests most countries, even those with a rather restrictive regulatory environment, can benefit from FDI.

Prasad et al. (2007) find that there is a positive correlation between the current account balance and economic growth among non-industrialized countries, implying that a reduced reliance on foreign capital is associated with higher growth. This result is weaker when they use panel data rather than cross-sectional averages over long periods of time, but in no case do they find an evidence that an increase in foreign capital inflows directly boosts growth.

Athukorala (2003) examines the relationship between FDI and GDP using time series data from the Sri Lankan economy. His econometric result shows that FDI inflows do not exert an independent influence on economic growth. Moreover, the direction of causation is not from FDI to growth but rather from growth to FDI.

Bhattia, et al. (2005) examine the relationship between FDI and economic growth for twenty OECD countries over the period 1981-2000 by using econometric methodology and their empirical findings clearly suggest that FDI does not have statistically significant effect on economic growth for those investigated OECD Countries.

Chakraborty (2008) subjects industry-specific FDI and output data to Granger causality tests within a panel co-integration framework that FDI stocks and output are mutually reinforcing in the manufacturing sector, whereas a causal relationship is absent in the primary sector. They find only transitory effects of FDI on output in the services sector. However, FDI in the services sector appears to have promoted growth in the manufacturing sector through cross-section spillovers.

Caves (1996) finds bidirectional relationship as FDI and growth are positively interdependent. A rapid economic growth provides high profit opportunities attracting higher domestic and foreign direct investments. On the other hand, FDI through its positive spillover effect has a direct contribution to growth. Chowdhury and Mavrotas (2006) also found bi-directional causality whereas Kholdy and Sohrabian (2005) found no causal link between FDI and growth.

We can see from a long list of studies reviewed above that the empirical findings have so far not offered a clear conclusion with respect to the causality between FDI and growth. The surge of FDI might be associated with domestic policy variables. De Mello (1996) finds that FDI plays a decisive role in increasing both output and total factor productivity (TFP) in Chile, while capital accumulation and TFP growth precede FDI in Brazil. In both cases, the direction of the relevant causality cannot be determined. The direction of causality between FDI and growth may well depend on the determinants of FDI. If the determinants have strong links with growth in the host country, growth may be found to cause FDI, while output may grow faster when FDI takes place in other circumstances (De Mello, 1997). Similarly, using data from 69 countries over 1970–1989, Wang and Wong (2009) find that FDI promotes productivity growth only when the

host country reaches a threshold level of human capital; and FDI promotes capital growth only when a certain level of financial development is achieved.

CHAPTER FOUR

Theoretical Framework, Methodology and Data

4.1 Theoretical Framework and Econometric Specification

Econometric analyses of the relationship between FDI and growth have been popular, but the conclusion from these exercises has remained unclear. Since growth depends on many factors whose effects are difficult to disentangle, and since FDI itself affects several of these factors, an agnostic start on another econometric look is probably the most desirable. This paper takes the conventional neoclassical production function that considers FDI (foreign capital) as a factor input along with other important growth driving factors in order to investigate the relationship between economic growth and FDI. In light of the insights gained from the literature review section, we begin with a conventional neoclassical model for the aggregate production function for Bangladesh as follows:

$$Y = A \cdot f(K, L, H) \quad (1)$$

where Y is Income, A is total factor productivity, K is physical capital, L is Labor force, and H is human capital. As shown in section 3, the empirical growth literature has identified a number of variables that are typically correlated with economic growth (Lensik and Morissey, 2001; Barro, 1996; Borensztein et. al., 1998; Shahoo, 2006; Iqbal, 2006; and Carkovic and Levine, 2002). Three important variables, among others, that augment the basic production function are FDI, trade openness, and financial development. Incorporating these factors in the equation for output per person, equation (1) can thus be rewritten as:

$$ypc = y(gcf, fdi, hc, open, m2) \quad (2)$$

where,

ypc = GDP per capita at a constant dollar value of 2005

gcf = Gross capital formation as a percentage of GDP

fdi = Foreign direct investment, net inflow as a percentage of GDP

hc = Human capital, summing each year of education weighted by its respective return to education

xm = Total trade as a percentage of GDP

$m2$ = Broad money (M2) as a percentage of GDP; a measure of overall liquidity or financial development.

All of the variables on the right hand side of equation (2) have been repeatedly used in the literature as possibly influencing per capita growth. FDI is net inflow of foreign direct investment as a percentage of GDP, and represents acquisition of lasting management interest in an enterprise operating in an economy other than the home country of the investor. The measurement of FDI is the sum of equity capital, reinvestment of earnings, other long-term and short-term capital as recorded in the balance of payments account. Private portfolio investment is not included in FDI. Per capita GDP, ypc , is measured in real dollars at 2005 international prices. Degree of economic openness ($open$) is the percentage of total trade to GDP; Human Capital is measured by summing each year of education weighted by its respective return to education as calculated and reported since 2013 on the Penn World Table 8.0. Financial depth or development is measured as currency plus demand deposits plus other interest bearing liabilities of banks and non-bank financial intermediaries as a percentage of

GDP. King and Levine (1993) show that this measure of financial development is closely related to long-term economic growth. Gross capital formation is the total real investment as a percentage of GDP.

While growth literature has used all these variables as basic or proximate factors affecting income or growth, several of these variables can be considered as endogenous in the context of a growth model. In particular, as we discovered in the literature section, FDI and trade can easily be endogenous although they are also assumed to affect GDP and growth. Thus, for FDI, following the literature, we postulate a relationship as given below:

$$fdi = f(infra, hc, ypc, remt, tnrr, gg) \quad (3)$$

where

infra = Physical infrastructure, proxied by railroads (total distance in kilometers), telephone lines (number per 100 people), and per capita electric power consumption (in kilowatt hours, or kwh),

remt = Remittance received as a percentage of GDP,

tnrr = Total natural resource rent as a percentage of GDP,

gg = Good governance (democratic government).

Physical infrastructure is measured as the electric power consumption in kwh per capita, railroads in kms, and telephone lines per 100 people. The remittance variable is personal remittances received as a percentage of GDP. Total natural resource rents include rents from oil, natural gas, coal, minerals and forest resources. Good governance is proxied by a dummy variable which takes the value 1 for democratic government and 0

otherwise. Bangladesh entered into parliamentary democracy since the 1990s. Before then, Bangladesh was mostly governed by military governments since her independence in 1971 and all elections' during that time were also conducted under military rule.

Trade is another endogenous variable that appears in our growth regression. Trade depends on domestic income and the real effective exchange rates. Income is a principal determinant of domestic imports but can also partly determine exports for a small economy if the economy is mostly supply constrained so that a greater output leads to more exports. The real exchange rate is the price of domestic goods per unit of foreign goods. A rise in this rate will tend to boost exports and reduce imports by making home goods relatively cheaper. Thus total trade should primarily depend on the income and price variables as shown in equation (4):

$$Open = x(ypc, reer) \quad (4)$$

where,

reer= Real effective exchange rate of the national currency (taka per US\$), which is the trade-weighted exchange rate adjusted for foreign to home price ratio.

Based on the functional relationships summarized in equation (2), (3) and (4), we can develop the following simultaneous equation system:

$$\begin{aligned} dlnypc_t = & \beta_0 + \beta_1(gcf_t) + \beta_2(fdi_t) + \beta_3(hc_t) + \beta_4(fdi_t*hc_t) + \beta_5(open_t) + \beta_6(m2_t) \\ & + \beta_7(fdit*m2t) + \varepsilon_{5t} \end{aligned} \quad (5)$$

$$\begin{aligned} fdi_t = & \beta_0 + \beta_1(rail_t) + \beta_2(elect_t) + \beta_3(tele_t) + \beta_4(dlnypc_{t-1}) + \beta_5(remt_t) + \beta_6(hc_t) \\ & + \beta_7(tnrr_t) + \beta_8(gg_t) + \varepsilon_{6t} \end{aligned} \quad (6)$$

$$open_t = \beta_0 + \beta_1(dlnypc_t) + \beta_2 lnreer_t + \varepsilon_{7t} \quad (7)$$

All the coefficients are expected to have a positive sign except remittances because an abundance of remittance receipts may lessen the reliance on foreign capital. In our statistical models, per capita GDP growth, FDI, and trade openness are likely to be endogenous variables and gross capital formation, human capital, broad money supply, infrastructure, remittance, and real effective exchange rate are taken to be exogenous. More discussion on this has been provided further below. To control for the potential endogeneity problems, we adopt instrumental variables (IV) estimation such as the values of FDI and trade openness estimated in terms of all the exogenous variables are then used in our original growth equation (5). Though in reality perfect instruments are hard to obtain, we take statistical approaches to test for endogeneity by first running OLS estimates to choose the best instruments for FDI and trade openness.

Human capital and financial depth as measured by broad money supply can be taken as exogenous because in Bangladesh they work more like policy variables and are therefore predetermined. Public investment in education is high and policies on financial development are controlled by Bangladesh Bank, the central bank of the country. The real effective exchange rate is the multiplication of nominal exchange rate multiplied by the ratio of foreign to home price ratio where foreign prices are arrived at by giving trade weights to the prices prevailing in the respective trade partners of Bangladesh. Again, the exchange rate for a small developing economy like Bangladesh is mostly determined by external factors. Other explanatory variables such as remittances, gross capital formation, and infrastructure are also assumed to be exogenous in our simplified model. An

important reason for such simplification is near impossibility of finding instruments for these explanatory variables from our available dataset.

The model includes a few interaction terms to help explore whether the relationship between an explanatory factor and the dependent variable depends on the level of the explanatory variable. Interaction between FDI and human capital ($FDI*HC$) helps to capture the effect of a well-educated workforce that could enhance the domestic absorptive capacity for foreign technology and new ideas. Interaction between FDI and financial depth ($FDI*M2$) helps to catch any complementarity between the two variables. These two interaction terms can tell us whether FDI promotes growth only when the host country reaches a threshold level of human capital or financial development.

4.2. Vector Autoregression (VAR) and Causality

We can also identify the direction of causality between FDI and growth in the Granger sense. If the determinants of FDI have strong links with growth in the host country, growth may be found to cause FDI. On the other hand, output may grow faster when FDI increases directly without having a strong link through other factors (De Mello, 1997). The empirical relationship between FDI and growth can be examined through a statistical technique for causality, in the sense of precedence, as developed by Granger (1981). The method can detect unidirectional or bidirectional relationship between growth and FDI.

In order to obtain consistent results derived from the Granger causality procedure three steps will be followed. The first step is to test whether there is a unit root in the variables and if yes, how many unit roots are there or, in other words, what is the order of integration of the variables. The Augmented Dickey Fuller (ADF) test can be used for this purpose. If the time series contains a unit root, the data may follow a random walk model. If a series is nonstationary (for example, in the case of a random walk), then we cannot rely on the test statistics from the regular OLS such as t-statistic, F-statistic and so forth, and must resort to such tests as the ADF test.

The second step is to run a reduced form VAR (p) model for per capita growth and FDI. A reduced form VAR expresses each variable as a linear function of its own past values, the past values of all other variables being considered, and a serially uncorrelated error term. Thus, our statistical model for the VAR analysis can be written as follows:

$$dlnypc_t = \alpha_1 + \beta_{11} dlnypc_{t-1} + \dots + \beta_{1p} dlnypc_{t-p} + \theta_{11} fdi_{t-1} + \dots + \theta_{1p} fdi_{t-p} + e_{8t} \quad (8)$$

$$fdi_t = \alpha_2 + \beta_{21} dlnypc_{t-1} + \dots + \beta_{2p} dlnypc_{t-p} + \theta_{21} fdi_{t-1} + \dots + \theta_{2p} fdi_{t-p} + e_{9t} \quad (9)$$

The third and final step is to carry out the Granger causality tests. The appropriate formulation of this test, applicable only to stationary series, is, with or without the intercept term:

$$dlnypc_t = \sum_{i=1}^n a_i GDPG_{t-i} + \sum_{j=1}^m b_j FDI_{t-j} + e_{10t} \quad (10)$$

$$FDI_t = \sum_{i=1}^n c_i GDPG_{t-i} + \sum_{j=1}^m d_j FDI_{t-j} + e_{11t} \quad (11)$$

A rejection of the null hypothesis that FDI does not Granger-cause per capita growth requires that (a) estimated coefficients on the lagged FDI in (10) are statistically different from zero (i.e., $b_j \neq 0$ for one or more j) and (b) the set of estimated coefficients on the lagged growth in (11) is not statistically different from zero (i.e., $c_j = 0$ for all j). Similarly, rejection of null hypothesis that GDP per capita growth does not Granger-cause FDI requires that (a) the estimated coefficients on the lagged FDI in (10) are not statistically different from zero (i.e., $b_j = 0$ for all j) and the set of estimated coefficients on the lagged GDP per capita growth in (11) is not statistically different from zero (i.e., $c_j \neq 0$ for one or more j).

This study uses annual data on Bangladesh for the period from 1975 to 2012. Data are compiled from World Development Indicators (WDI) 2014 from the World Bank, International Financial Statistics (IFS) 2013 from the International Monetary Fund, and Penn World Table (version 8.0).

Table 4.1 presents descriptive statistics on all the variables in the model. The indicators reflect typical characteristics in poor developing countries with a low per capita GDP, relatively low financial development and small FDI inflows. However, the Table also shows reasonably high standard deviations in all these indicators which actually indicates relatively rapid growth in those indicators.

Table 4.1 - Descriptive Statistics of Variables

| Variables | Units of Measurement | Mean | Standard Deviation | Min | Max | No. of Obs. |
|-----------|--------------------------------------|-----------|-----------------------|-----------|-----------|----------------|
| M2 | M2/GDP percentage | 33.14008 | 18.64253 | 8.353727 | 69.73062 | 38 |
| Elect | Kwh per capita | 92.20209 | 77.27847 | 16.75773 | 278.4252 | 38 |
| Fdi | Net inflows as a % of GDP | 0.3209729 | 0.4358729 | -0.05146 | 1.349295 | 38 |
| Ypc | GDP per capita at constant 2005 US\$ | 332.0658 | 103.9201 | 226.4999 | 597.0206 | 38 |
| Gcf | % of GDP | 18.98581 | 4.910604 | 6.147906 | 26.54181 | 38 |
| Remt | % of GDP | 4.516966 | 3.388628 | 0.155483 | 12.10513 | 38 |
| Rail | Total route in KM | 2810.644 | 191.909 | 1885 | 3125 | 38 |
| Hc | Average years of schooling | 1.648902 | 0.2663069 | 1.234397 | 2.151824 | 38 |
| Tnrr | Nat. reso. rent, % of GDP | 4.004265 | 1.417241 | 2.367191 | 8.772094 | 38 |
| Tele | Per 100 people | 0.3426877 | 0.2574527 | 0.0830275 | 0.9086006 | 38 |
| Open | Trade, % of GDP | 28.8564 | 11.62421 | 10.99563 | 55.29305 | 38 |
| Reer | Taka per dollar, period average | 41.92626 | 19.93951 | 12.18618 | 81.86266 | 38 |
| Gg | Dummy (1 democ., 0 otherwise) | 0.6052632 | 0.4953554 | 0 | 1 | 38 |

CHAPTER FIVE

Results and Discussion

Before running OLS and 2SLS estimates, all variables were examined for stationarity both in level form and lag form at the 10 percent or lower level of significance according to Augmented Dickey-Fuller (ADF) test for unit root. Most of the variables are found stationary in either form. As the study covers the period 1975-2012 and FDI inflow into Bangladesh started in the 1990s, we should note that it is hard to place a high degree of reliance cannot be placed on the Dickey-Fuller distribution of the parameters because the small sample properties of D-F distribution is not well established. To that extent, the results for this part of the study are only indicative rather than conclusive.

5.1. Ordinary Least Square (OLS) and Two Stage Least Square (2SLS)

Table 5.1 gives least-squares estimates of regression coefficients for the FDI equation in (6). We observe that two out of three infrastructure variables are statistically significant at the 10 percent or lower level and two coefficient estimates do not have their anticipated signs. The goodness of fit of the model is fairly strong as indicated by the value of 0.8824 for the adjusted R^2 .

Table 5.1 - Dependent Variable: Foreign Direct Investment (OLS)

| Variables | Coefficient Estimates | t-statistics | p-value |
|-------------------------------|-----------------------|--------------|---------|
| <i>Intercept</i> | -0.379 | -0.45 | 0.658 |
| <i>Rail</i> | 0.0001 | 1.06 | 0.299 |
| <i>Elect</i> | 0.004 | 2.00** | 0.055 |
| <i>Tele</i> | 1.563 | 4.55*** | 0.000 |
| <i>Dlnypc_{t-1}</i> | 1.609 | 0.61 | 0.546 |
| <i>Remt</i> | -0.073 | -1.82* | 0.079 |
| <i>Hc</i> | -0.147 | -0.27 | 0.792 |
| <i>Gg</i> | -0.145 | -1.17 | 0.251 |
| <i>Adjusted R²</i> | 0.8824 | | |

*significance at the 10 percent level, **significance at the 5 percent level, *** significance at 1 percent level

One concern here is that FDI might be affected by a threshold level of growth. The graphical presentation of FDI inflows shows that most of the FDI occurred when the growth rate is above 4 percent. Therefore, we generate a threshold dummy that takes the value 1 if growth is above 4 percent and 0 otherwise. Similarly, we assign judicious, albeit the author's subjective, weights to components of infrastructure to create a composite infrastructure variable. These weights are 20% for rail, 40% for telephone, and 40% for electricity, based on the author's evaluation of the relative importance of each form of infrastructure in Bangladesh. Taking all these considerations together, we develop a modified regression equation as follows:

$$fdi_t = \beta_0 + \beta_1 infra + \beta_2 (dlnypc_{t-1}) + \beta_3 (remt_t) + \beta_4 (dummyg4_t) + \beta_5 (hc_t) + \beta_6 (tnrr_t) + \beta_7 (gg_t) + \varepsilon_{12t} \quad (12)$$

Table 5.2 presents the OLS estimates of the modified regression equation (12). We observe that three coefficients are statistically significant at 1 percent level and one

coefficient is significant at 10 percent level. All coefficients do have expected signs except for the threshold growth of 4 percent plus (*dumyg4*) and good governance (*gg*). The goodness of fit of the modified regression is slightly increased as indicated by the value of 0.8912 of the adjusted R^2 . However, good infrastructure is virtually a precondition for attracting FDI, the infrastructure variable turns out to be fairly insignificant.

Table 5.2 - Dependent Variable: Foreign Direct Investment (Modified OLS)

| Variables | Coefficient Estimates | t-statistics | p-value |
|-------------------------------|-----------------------|--------------|---------|
| <i>Intercept</i> | -2.652 | -3.52*** | 0.0001 |
| <i>Infra</i> | 0.0008 | 1.28 | 0.211 |
| <i>Dlnypc_{t-1}</i> | 0.023 | 2.75*** | 0.010 |
| <i>Remt</i> | -0.056 | -1.79* | 0.085 |
| <i>Dumyg4</i> | -0.097 | -0.85 | 0.403 |
| <i>Hc</i> | 1.368 | 2.92*** | 0.007 |
| <i>Tnrr</i> | 0.105 | 4.51*** | 0.000 |
| <i>Gg</i> | -0.169 | -1.47 | 0.152 |
| <i>Adjusted R²</i> | 0.8912 | | |

*significance at the 10 percent level, **significance at the 5 percent level, *** significance at the 1 percent level

Next, Table 5.3 shows the OLS estimates of trade openness (*open*) regression in equation (7). The objective of the regression for trade openness which is an explanatory factor in the growth regression is to instrument this variable in terms of other non-endogenous variables. The variable log real effective exchange rate (*lnReer*) is found trend stationary at the 10 percent level according to the Augmented Dickey-Fuller test for

unit root. We notice from Table 5.3 that all the coefficients are statistically significant at 1 percent or lower level and all the coefficients give us expected signs. The value of the adjusted R^2 (0.898) is also fairly high.

Table 5.3 - Dependent Variable: Trade Openness (OLS)

| Variables | Coefficient Estimates | t-statistics | p-value |
|-------------------------------|-----------------------|--------------|---------|
| <i>Intercept</i> | 12.109 | 6.57*** | 0.000 |
| <i>Dlnypc</i> | 0.733 | 4.87*** | 0.000 |
| <i>Lnreer</i> | 0.231 | 3.35*** | 0.002 |
| <i>Adjusted R²</i> | 0.8975 | | |

***significance at 1 percent level

Table 5.4 gives the coefficient estimates of the base growth regression in equation (5) before accounting for any endogeneity in the right-hand-side variables (FDI and openness). The most surprising thing about the results in Table 5.4 is that the gross capital formation is related inversely with growth. Is it possible to have gross investment variable to reduce growth? From summary statistics (Table 4.1) we know Bangladesh has only invested 19 percent of GDP annually over 37 years. This is not a very large percentage when we compare it with the investment in emerging economies that have attained medium to high growth. This raises a question about other possible reasons for a negative marginal return on investment. On FDI, there is no significant relationship of FDI with output growth. However, both human capital and openness exhibit a significantly positive relationship with growth. The adjusted R^2 at 0.89 is high.

Table 5.4 - Dependent Variable: GDP per capita growth at a constant US\$ of 2005 (OLS)

| Variables | Coefficient Estimates | t-statistics | p-value |
|-------------------------------|-----------------------|--------------|---------|
| <i>Intercept</i> | -22.937 | -1.22 | 0.232 |
| <i>Gcf</i> | -0.959 | -2.16** | 0.039 |
| <i>Fdi</i> | 10.612 | 0.180 | 0.857 |
| <i>Hc</i> | 24.032 | 1.29* | 0.206 |
| <i>Open</i> | 0.298 | 1.99** | 0.056 |
| <i>M2</i> | 0.033 | 0.130 | 0.898 |
| <i>Fdihc</i> | -7.030 | -0.160 | 0.874 |
| <i>fdim2</i> | 0.153 | 0.290 | 0.777 |
| <i>Adjusted R²</i> | 0.8946 | | |

**significance at 5% level, *significance at 20 percent level

Results from Table 5.4 lead to the conclusion that OLS does not provide a significant and consistent output for desired explanatory variables. To account for endogeneity in the two noted variables, we use the instrumental variable approach, obtain the predicted values for FDI and openness from regression (6) and (7) and use them in the estimation of equation (5) above. Results of this 2SLS regression are reported in Table 5.5. We observe that three out of six explanatory variables are statistically significant at the 10 percent or lower level but two coefficient estimates do not have their anticipated signs. Calculations based on estimated coefficients indicate that as the share of foreign direct investment in GDP increases by 1 percentage point, we can expect an increase of 1.64 percentage points in per capita GDP growth, other things being equal. We note that

the intercept term, which captures the effect of technological progress, is statistically significant at the 5 percent level.

Table 5.5 - Dependent Variable: GDP per capita growth (2SLS1)

| Variables | Coefficient Estimates | t-statistics | p-value |
|-------------------------------|-----------------------|--------------|---------|
| <i>Intercept</i> | -25.665 | -2.05** | 0.050 |
| <i>Fdi</i> | 18.556 | 1.86* | 0.073 |
| <i>Open</i> | 0.119 | 0.31 | 0.756 |
| <i>Laggcf</i> | -0.159 | -0.27 | 0.788 |
| <i>Laghc</i> | 20.276 | 1.19 | 0.246 |
| <i>Fdihc</i> | -18.698 | -2.29** | 0.029 |
| <i>Fdim2</i> | 0.427 | 1.94* | 0.062 |
| <i>Adjusted R²</i> | 0.8368 | | |

Instrumented: fdi, xm

Instruments: laggcflaghcfdihc2fdim22dlnypclag1remthctnrrlnreer

**significance at 5 percent level, * significance at 10 percent level

Since FDI is the pivotal explanatory variable to explain growth in this paper, we check the robustness of our exercise by introducing some modifications in our 2SLS regression to examine the net effect of FDI in our model. The reasons behind these modifications are: first, M2 is an ambiguous variable to represent the financial depth in an economy where informal financial market is relatively large. M2 also reflects some business cycle trends rather than just the long-term growth phenomenon. Further, it cannot capture other aspects of financial development in an economy such as strength of the stock market.

Still another reason for slightly changing the model is that human capital takes time to contribute to economic growth. Also, by leaving out other aspects of human capital accumulation such as on-the-job training and changes in health situation, the measured human capital variable fails to accurately represent the true human capital. Finally, trade openness is also not an exogenous variable since output growth can influence both exports and imports in Bangladesh. The results after suitable modifications to the model appear in Tables 5.6 and 5.7.

Table 5.6- Dependent Variable: GDP per capita growth at a constant US\$ of 2005 (modified 2SLS2)

| Variables | Coefficient Estimates | t-statistics | p-value |
|-------------------------------|-----------------------|--------------|---------|
| <i>Intercept</i> | -12.401 | -2.53*** | 0.017 |
| <i>Fdi</i> | 13.303 | 1.47 | 0.151 |
| <i>Open</i> | 0.459 | 1.96** | 0.059 |
| <i>Laggcf</i> | 0.417 | 1.40 | 0.170 |
| <i>Fdihc</i> | -16.683 | -2.27** | 0.031 |
| <i>fdim2</i> | 0.401 | 2.03** | 0.051 |
| <i>Adjusted R²</i> | 0.8679 | | |

Variables instrumented: fdi xm

Instruments: laggcfdi hc2 fdim22 dlnypclag1 remt hc tnrr lnreer

significance at 5 percent level, * significance at 1 percent level

**Table 5.7- Dependent Variable: GDP per capita growth at a constant US\$ of 2005
(modified 2SLS3)**

| Variables | Coefficient Estimates | t-statistics | p-value |
|-------------------------------|-----------------------|--------------|---------|
| <i>Intercept</i> | -7.238 | -1.51 | 0.142 |
| <i>Fdi</i> | 18.420 | 1.77* | 0.087 |
| <i>Laggcf</i> | 0.701 | 2.34** | 0.026 |
| <i>Fdihc</i> | -17.938 | -2.09** | 0.045 |
| <i>fdim2</i> | 0.513 | 2.34** | 0.026 |
| <i>Adjusted R²</i> | 0.8222 | | |

Instrumented: fdi

Instruments: laggcfdi fdihc2 fdim22 dlnypclag1 remt hc tnrr

*significance at 10 percent level, ** significance at 5 percent level

Table 5.6 shows that when both FDI and trade openness are instrumented, we observe that three out of five coefficients are statistically significant at the 5 percent level. The adjusted R^2 stays fairly high at 0.87. But when only foreign direct investment is instrumented (Table 5.7), we observe that three out of four coefficients turn out statistically significant at 5 percent level and one coefficient is statistically significant at 10 percent level. The 2SLS regression in Table 5.7 reveals that if the share of FDI in GDP increases by 1 percentage point, we would expect an increase of 6.05 percentage points in per capita GDP growth rate if and only if FDI is instrumented, other things being equal. This result is surprising because of the large size of the effect of FDI although one can argue that it was FDI-led initial impetus given to the textile and garment industry that led to a boom in manufacturing investment and a major push to

exports. In the empirical literature we do not find such a high effect of FDI on GDP growth in any country which raises a question about model misspecification of some kind. However, there is no basis on which to claim that the effect captured by the regression will continue for any time in future, particularly as domestic investment becomes larger and more mature. Our significant attempts to further tweak the model in light of empirical exercises conducted by other authors and discussed in the literature review section have failed to uncover values for the growth effect of FDI lower than the range of estimates between 1.65 and 6.05 implied from the numbers reported in Tables 5.5 and 5.7.

5.2. VAR and Causality

In this subsection, an attempt is made to test the nature of causality between FDI and output growth by using the standard econometric approach of vector autoregression. As explained earlier, the method includes lagged values of both these variables in each equation to test whether all the lags of a variable jointly have zero effect on the other variable. This requires the selection of the appropriate lag length. Standard criteria are available for the purpose. Akaike Information Criterion (AIC) suggests a lag length of one year while the Schwartz-Bayesian Information Criterion (SBIC) suggests a lag length of two years as the lowest AIC or SBIC value (Figure 14). As the reduced form VAR model requires the same number of lags for all variables in all equations, we prefer the lag length order of two in our causality analysis.

Table 5.8- Results of reduced form VAR

| Estimated | Constant | Dlnypc(1) | Dlnypc(2) | Fdi(1) | Fdi(2) |
|---------------------------------|-------------------|------------------|------------------|------------------|-------------------|
| Coefficients | | | | | |
| α_1 | 1.70 (1.68) | | | | |
| α_2 | -0.042 (0.431) | | | | |
| $B_{11} \dots \beta_{1p}$ | | 0.354 (0.032) | 0.344 (0.039) | | |
| $B_{21} \dots \beta_{2p}$ | | 0.011 (0.191) | 0.012 (0.162) | | |
| $\theta_{11} \dots \theta_{1p}$ | | | | 7.755 (0.022) | -0.883 (0.809) |
| $\theta_{21} \dots \theta_{2p}$ | | | | 0.680 (0.000) | -0.165 (0.391) |

Notes: p-values are in parenthesis

The results from table 5.8 show that lagged FDI and lagged GDP per capita help to predict current GDP per capita growth at 5 percent level of significance. However, the lagged GDP per capita does not predict the current FDI. The direction can be further examined by the results of the Granger causality test shown in Table 5.9 which shows that GDP per capita does Granger cause FDI at the 5 percent significance level, whereas we find a bi-directional causality between FDI and growth at the 10 percent level.

Table 5.9- Granger Causality Wald tests

| Null Hypothesis | Chi ² statistic | p-value |
|---|----------------------------|---------|
| GDP per capita growth does not Granger cause FDI | 5.95** | 0.051 |
| FDI does not Granger cause GDP per capita growth | 5.45* | 0.066 |

*significance at 10 percent level, ** significance at 5 percent level

CHAPTER SIX

Conclusion and Policy Implications

This thesis has investigated three aspects of the role of foreign direct investment in economic development of Bangladesh: a) identifying the major determinants of FDI; b) to what extent FDI contributes to per capita GDP growth; and c) determining the direction of causality, whether FDI causes growth, growth causes FDI, or both.

Our OLS estimates suggest that human capital, remittance, total natural resources rent, and lagged per capita GDP are the significant determinants of FDI in Bangladesh. After instrumenting the endogenous FDI and openness, the results of the 2SLS exercises suggest that if the share of FDI in GDP increases by 1 percentage point, we would expect an increase in per capita growth between 1.65 and 6.05 percentage points. These effects encompass a number of possibilities but they all point to a relatively large effect of FDI on growth. The policy implication toward boosting the amount of foreign direct investment is therefore clear. While this study offers a macro growth perspective alone, attempts to raise FDI must deal with policies on specific industries. Some of these industries might hold promise in terms of dynamic comparative advantage though the identification of such industries is never easy.

We also find from vector autoregression and Granger causality models that growth Granger causes FDI strongly but there is bi-directional causality between FDI and growth at slightly weaker 10 percent level of significance.

By now, Bangladesh has done away with most if not all entry and exit barriers in foreign investment. The country has signed international and bilateral arrangements with important trade partners, including India, US and EU, that have helped to reduce regulatory barriers to international trade and investment (WDR, 2005). It is true that cost of doing business in Bangladesh is often very high because of rent-seeking behavior of the members of the state bureaucracy and government. According to Doing Business Report 2012, Bangladesh ranked 122nd among 183 economies and 5th among SAARC nations on ease of doing business. The acrimonious nature of domestic politics that Bangladesh has been forced to cope with continuously for decades creates some uncertainty about stability of politics for investors.

To attract FDI, Bangladesh has to transform the poor state of its infrastructure. Our regression results for the effect of infrastructure on FDI were not highly significant indicating that marginal improvements may not lead to a more rapid growth. Yet, a major upgrade of infrastructure facilities could have a large potential in encouraging domestic investment as well as FDI. Furthermore, a consistent incentive package could be implemented by including trade policies such as rationalization of the tariff structure and elimination of non-tariff barriers; financial policies such as by streamlining interest rates at competitive levels and increasing access to finance; and institutional measures such as through enhancement of competitiveness and strengthening rules of corporate governance. It is generally true that FDI follows domestic investment which makes it imperative to create conditions for larger domestic investment. Bangladesh also

needs to look at investment opportunities within the South Asian region. Incremental regional investment complemented by the initiative to build a regional free trade area may work as a catalyst for attracting extra-regional FDI.

Finally, it can be argued that simply providing a better incentive package and more liberalization measures may not necessarily attract FDI. Literature does not show that FDI automatically boosts economic growth or that strong causal effect of FDI in the past, as was found for Bangladesh in this study, will inevitably continue in the future. A constant review of factors would be necessary since conditions that are appropriate for more FDI and for a greater impact of FDI on growth change from time to time.

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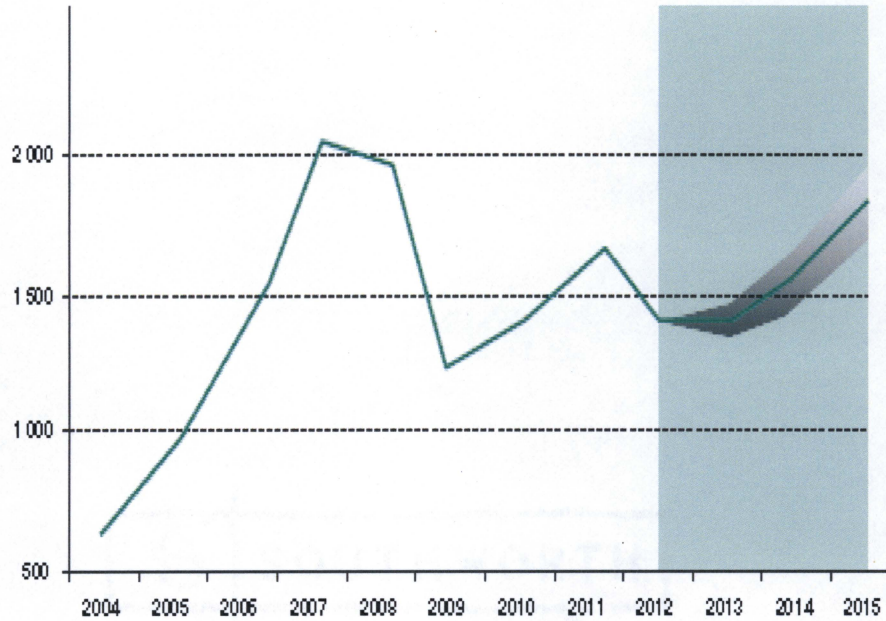
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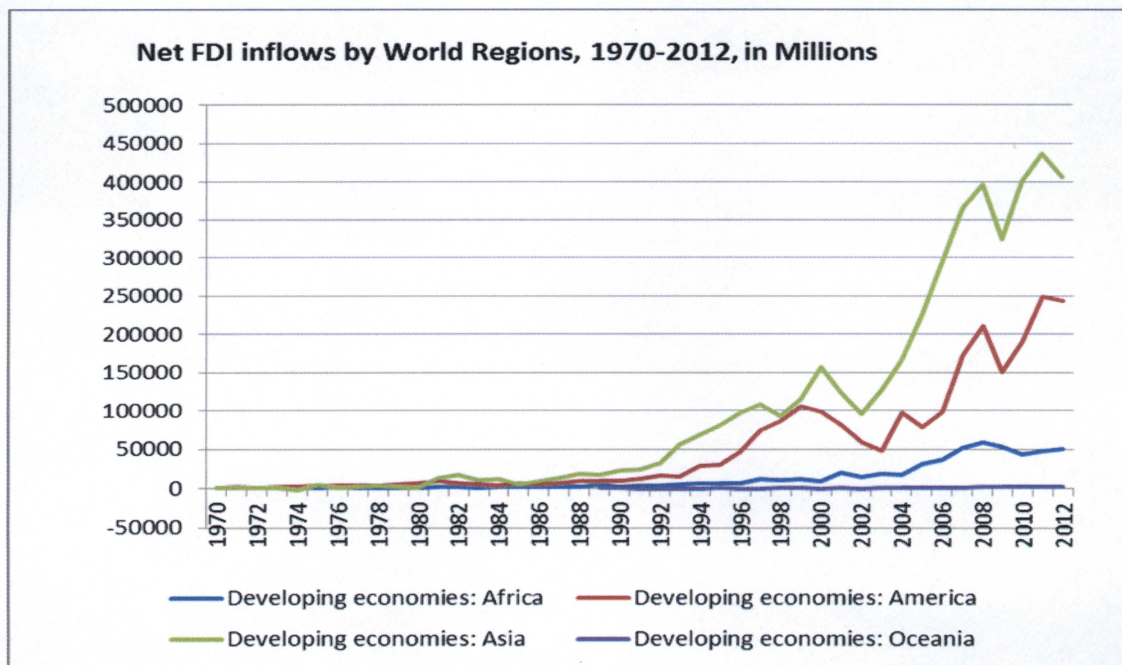
Appendix

Figure 1: Global FDI Inflows (Trillion US\$), 2004-2015*



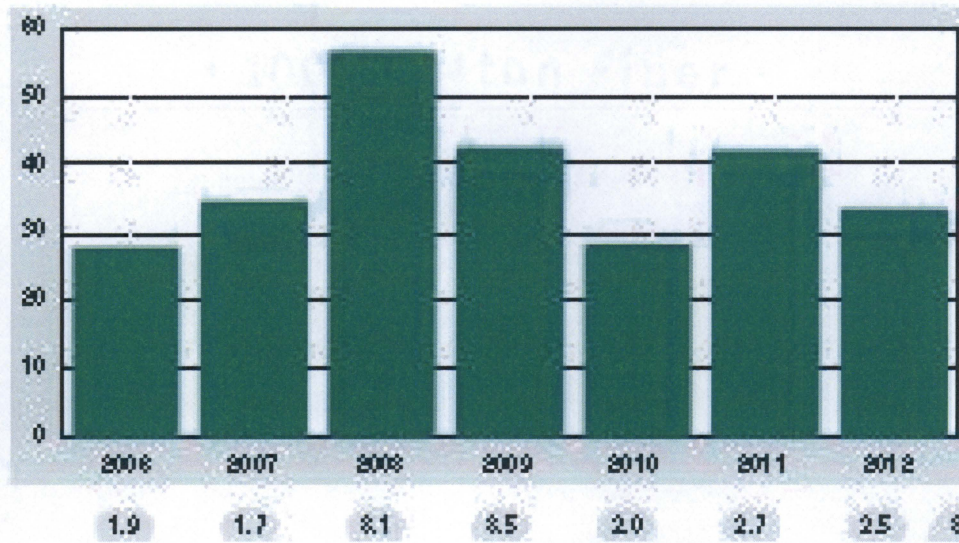
Source: UNCTAD, WIR 2013

Figure 2: Net FDI Inflows by World Regions, 1970-2012



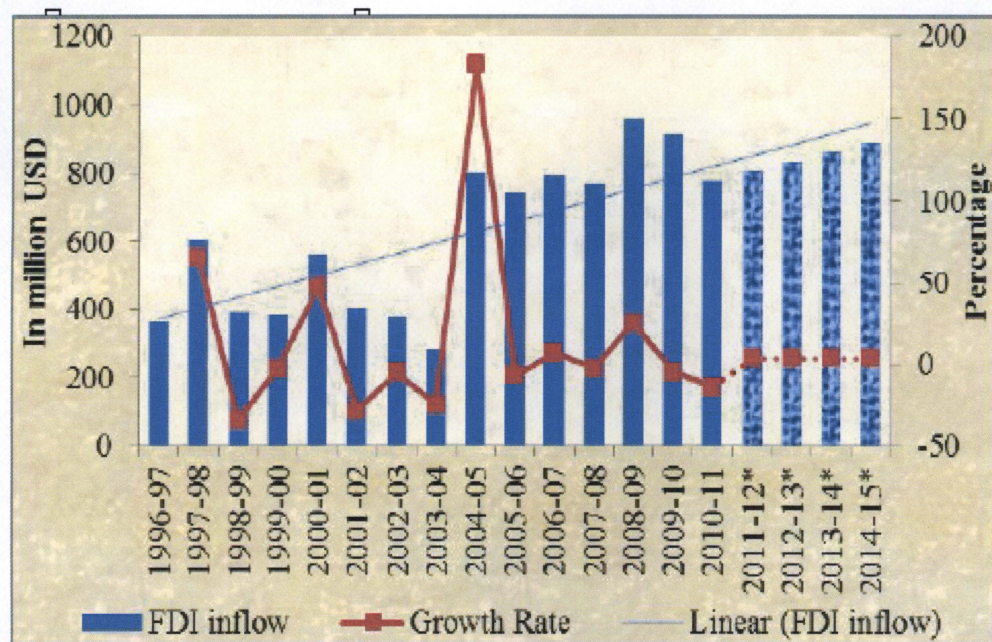
Source: UNCTAD, WIR 2013

Figure 3: FDI Inflows in South Asia, 2006-2012



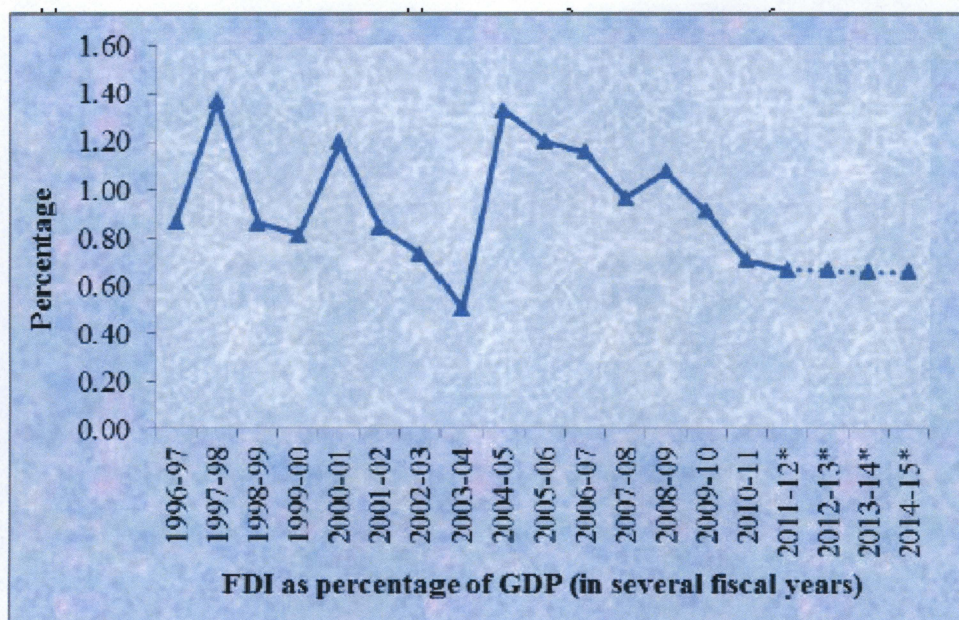
Source: UNCTAD, WIR 2013

Figure 4: FDI Inflow (Million US\$) in Bangladesh, 1996-2015*



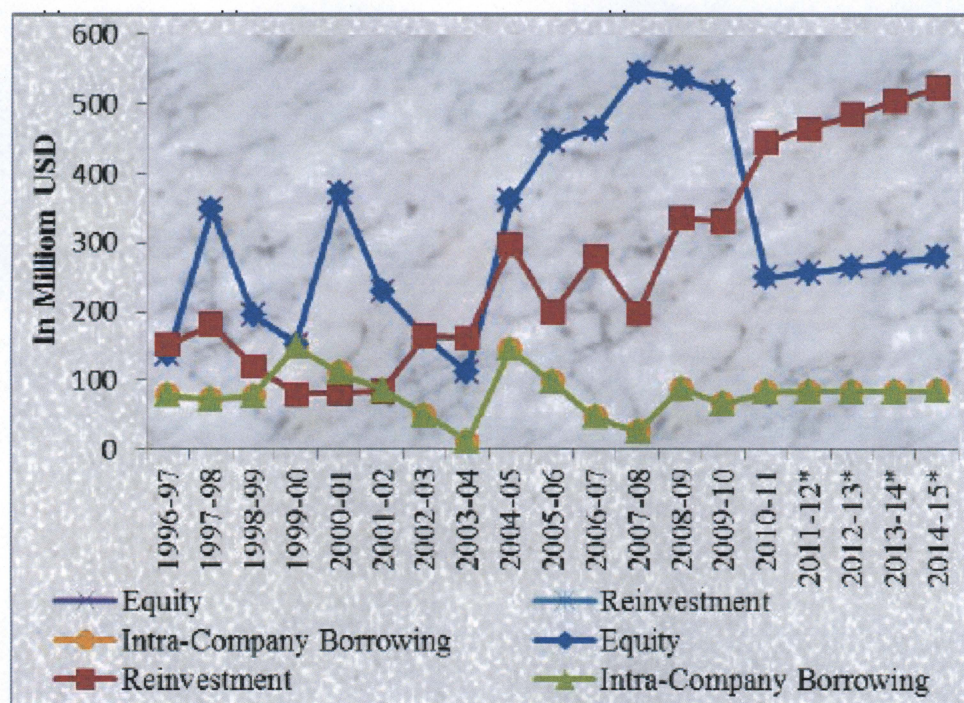
Source: Authors' calculation based Bangladesh Bank, 2012

Figure 5: FDI as a percentage of GDP in Bangladesh, 1996-2015*



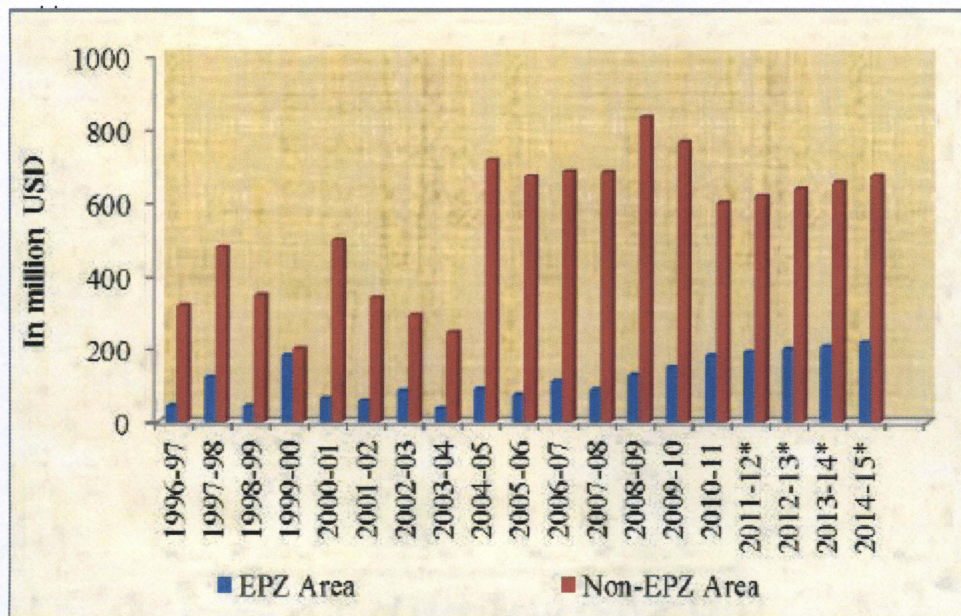
Source: Author's calculation based on Bangladesh Bank, Bangladesh Bureau of Statistics, 2012

Figure 6: Classification of FDI Inflows in Bangladesh, 1996-2015*



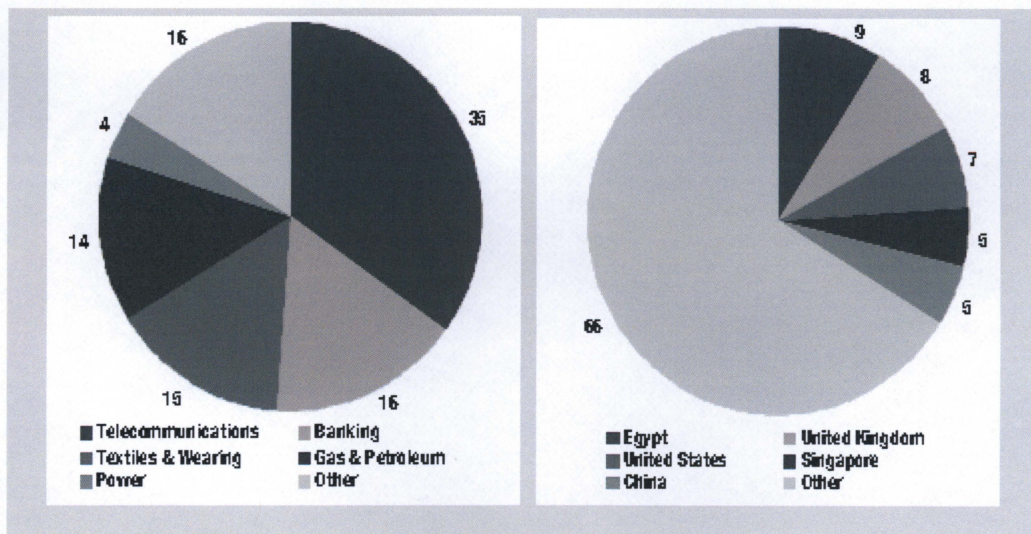
Source: Authors' calculation based on Bangladesh Bank, 2012

Figure 7: FDI Inflows in EPZs and Non-EPZs area in Bangladesh, 1996-2015*



Source: Authors' calculation based on Bangladesh Bank, 2012

Figure 8: FDI Inflows in Bangladesh by sector and country of origin (%), 2005-2011



Source: Bangladesh Bank

Note: China includes investments from China, Hong Kong Special Administrative Region

Figure 9: Impulse Response Function of FDI and GDP per capita growth

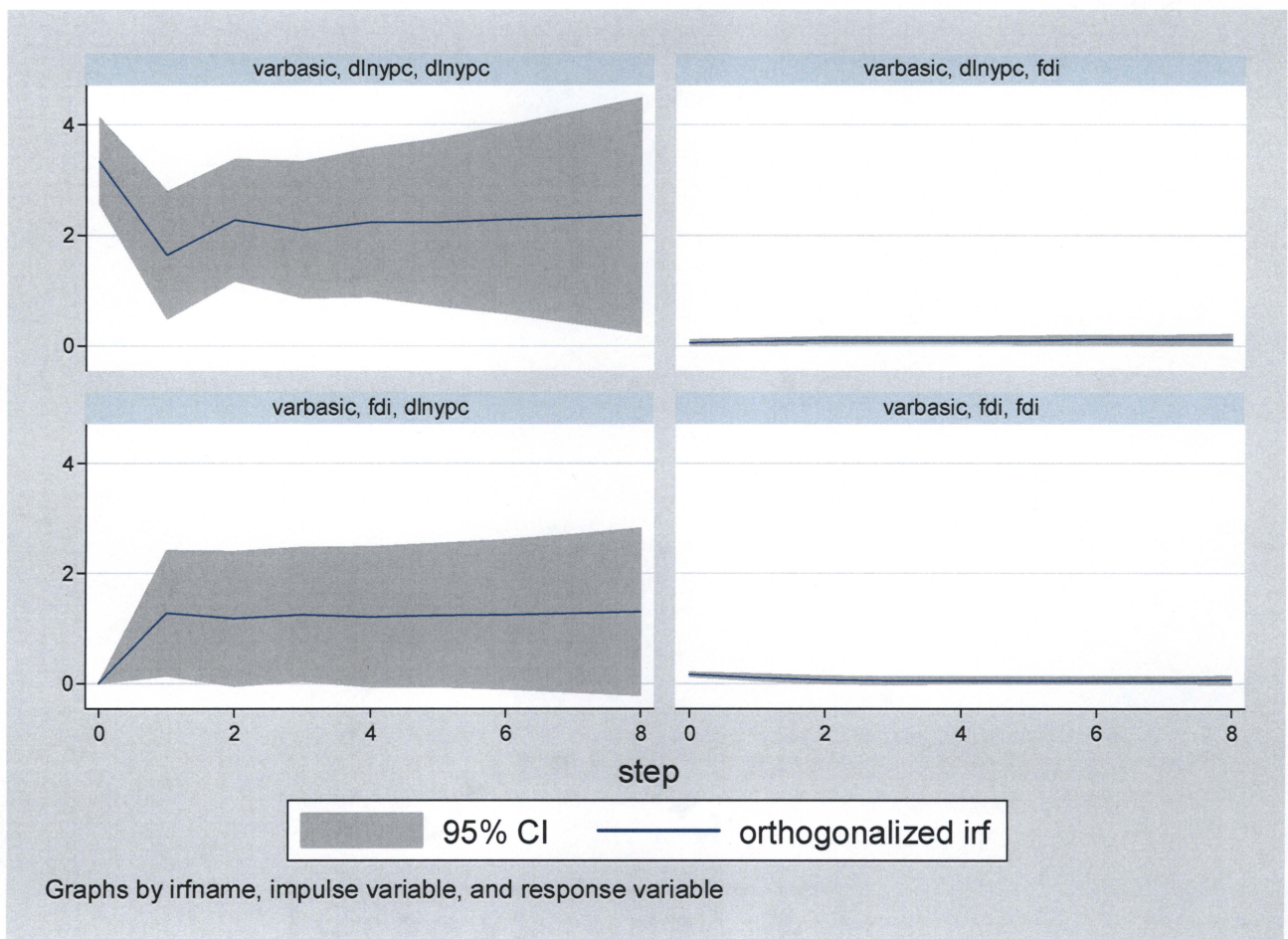


Figure 10: Global FDI Inflows (Million US\$), 1985-2006

| | 1985-90 | 1995 | 2000 | 2005-06 |
|----------------------|----------------|-------------|-------------|----------------|
| World | 49813 | 203341 | 331189 | 643879 |
| Developing Countries | 12634 | 31345 | 105511 | 165936 |
| Asia | 5043 | 18984 | 67386 | 84880 |
| SAARC | 178.8 | 458 | 2753 | 3433 |
| Bangladesh | -0.1 | 3 | 2 | 317 |
| Bhutan | Na | Na | Na | Na |
| India | 62 | 162 | 1964 | 2258 |
| Maldives | -0.3 | Na | 7 | 7 |
| Nepal | 0.2 | 6 | 5 | 9 |
| Pakistan | 75 | 244 | 719 | 497 |
| Sri Lanka | 42 | 43 | 53 | 345 |

Source: UNCTAD, World Investment Report, 2006

Figure 11: Country share of FDI as a percentage of total inflows to SAARC countries, 1985-2006

| | 1985-90 | 1995 | 2000 | 2005-06 |
|------------|----------------|-------------|-------------|----------------|
| Bangladesh | -0.1 | 0.1 | 0.1 | 9.2 |
| Bhutan | Na | Na | Na | Na |
| India | 34.7 | 35.4 | 71.3 | 65.8 |
| Maldives | -0.2 | Na | 0.2 | 0.2 |
| Nepal | 0.1 | 1.3 | 0.2 | 0.3 |
| Pakistan | 42 | 53.3 | 26.2 | 14.5 |
| Sri Lanka | 23.5 | 9.4 | 1.9 | 10 |

Source: Computed from Fig.10

Figure 12: FDI flows among South Asian Economies by their magnitude

| Range | Inflows | Outflows |
|------------------------|--|------------------------------------|
| Above \$ 10 billion | India | - |
| \$1.0 to \$9.9 billion | Islamic Republic of Iran | India |
| \$0.1 to \$0.9 billion | Bangladesh, Pakistan, Sri Lanka and Maldives | Islamic Republic of Iran |
| Below \$0.1 billion | Afghanistan, Nepal and Bhutan | Sri Lanka, Pakistan and Bangladesh |

Source: UNCTAD, WIR 2013

Figure 13: Pair wise correlation Matrix

| Var | M2 | Elect | fdi | Ypc | Gcf | remt | Rail | Hc | tele | Xm | reer | tnrr | Gg | dlndpc | Lnreer | fdihc |
|---------|------|-------|------|------|------|------|-------|-------|------|------|------|------|------|--------|--------|-------|
| M2 | 1.00 | | | | | | | | | | | | | | | |
| Elect | .982 | 1.00 | | | | | | | | | | | | | | |
| Fdi | .876 | .899 | 1.00 | | | | | | | | | | | | | |
| Ypc | .974 | .996 | .886 | 1.00 | | | | | | | | | | | | |
| Gcf | .904 | .873 | .793 | .859 | 1.00 | | | | | | | | | | | |
| Remt | .956 | .970 | .876 | .972 | .856 | 1.00 | | | | | | | | | | |
| Rail | .047 | .056 | .137 | .053 | .104 | .094 | 1.00 | | | | | | | | | |
| Hc | .973 | .957 | .852 | .946 | .958 | .924 | .004 | 1.00 | | | | | | | | |
| Tele | .952 | .940 | .934 | .926 | .856 | .940 | .074 | .926 | 1.00 | | | | | | | |
| Xm | .939 | .961 | .899 | .965 | .851 | .924 | .051 | .923 | .912 | 1.00 | | | | | | |
| Reer | .973 | .954 | .850 | .940 | .949 | .921 | .017 | .995 | .922 | .914 | 1.00 | | | | | |
| Tnrr | .486 | .508 | .683 | .498 | .318 | .561 | .128 | .388 | .646 | .548 | .395 | 1.00 | | | | |
| Gg | .706 | .673 | .562 | .648 | .777 | .588 | -.121 | .804 | .657 | .663 | .802 | .095 | 1.00 | | | |
| Lnndpc | .974 | .996 | .888 | 1.00 | .859 | .972 | .053 | .946 | .927 | .966 | .941 | .498 | .649 | 1.00 | | |
| Dlnndpc | .922 | .948 | .891 | .946 | .789 | .899 | .045 | .0892 | .903 | .933 | .893 | .519 | .666 | .946 | 1.00 | |
| Lnreer | .973 | .954 | .850 | .940 | .949 | .921 | .017 | .995 | .922 | .914 | 1.00 | .395 | .802 | .941 | .893 | 1.00 |
| Fdihc | .888 | .914 | .998 | .905 | .792 | .895 | .129 | .859 | .938 | .909 | .857 | .689 | .554 | .906 | .903 | .857 |
| Fdim2 | .903 | .933 | .982 | .926 | .772 | .920 | .124 | .853 | .938 | .913 | .854 | .704 | .523 | .927 | .913 | .854 |

Figure 14: Selection order criteria for number of lags

| Lag | LL | LR | Df | P | FPE | AIC | HQIC | SBIC |
|-----|---------|--------|----|-------|-------|--------|--------|--------|
| 1 | -68.913 | 76.482 | 4 | 0.000 | .371 | 4.682 | 4.773* | 4.957* |
| 2 | -64.774 | 8.279 | 4 | 0.082 | .369* | 4.673* | 4.825 | 5.131 |
| 3 | -62.049 | 5.449 | 4 | 0.244 | .403 | 4.753 | 4.966 | 5.394 |
| 4 | -58.943 | 6.212 | 4 | 0.184 | .433 | 4.809 | 5.082 | 5.633 |
| 5 | -54.176 | 9.535* | 4 | 0.049 | .425 | 4.761 | 5.095 | 5.799 |

Endogenous: dlndpc fdi

Exogenous: cons

FPE= Final Prediction Error

AIC= Akaike Information Criteria

HQIC= Hannan- Quinn Information Criteria

SBIC = Schwartz- Bayesian Information Criteria